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RECORD OF ORAL HEARING

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WOLFGANG HEIMBERG,
THOMAS HERRMANN, MATTHIAS KNULLE,
MARKUS SCHURF,
and TILMANN WAGNER

Appeal 2007-3385
Application 10/089,136
Technology Center 1700

Oral Hearing Held: Thursday, December 20, 2007

Before CHARLES F. WARREN, PETER F. KRATZ, and
LINDA M. GAUDETTE,
Administrative Patent Judges

ON BEHALF OF THE APPELLANTS:

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The above-entitled matter came on for hearing on Thursday, December 20, 2007, commencing at 11:14 a.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, 9th Floor, Hearing Room A, Alexandria, Virginia, before Kevin Carr.

MS. BEAN: Calendar Number 21, Mrs. Fisher.

JUDGE WARREN: Okay. Good morning, Ms. Fisher.

MS. FISHER: Good morning.

JUDGE WARREN: Have you brought a friend with you today?

MS. FISHER: I did. This is Phil Makrogiannis. He is the director of IP at Applied Biosystems. So he is here from California today so he can participate.

JUDGE WARREN: Okay. Our transcriber today is Mr. Carr.

You may proceed when ready, and as usual you have 20 minutes.

MS. FISHER: Okay. I'm going to have to put my glasses on and off. This is appeal number 2007/2385. What we have here is the Applied Biosystems specializes in creating devices for testing samples and PTR systems, those kind of devices. And the key to this invention is there's a thing called a micro titer plate, and I'm assuming that you read the disclosure. The micro titer plate will have as much as 96 sample wells, that the samples go in. And part of the process is to heat the samples for a duration, repeat the heating in several different cycles.

What has happened in the past is, say you have a sample plate and maybe you want to perform with the same sample as you want to have different temperatures on different parts of the samples just for efficiency purposes. They haven't been able to do that, except for putting them in maybe

separate systems for the heating and cooling of the samples. So now what they're trying to do is simplify the procedure. We want to use one micro titer plate. We want to be able to test different segments of the micro titer plate, each having different reaction times, different temperatures. And the unique thing about this invention is that you can actually have maybe one section of the micro titer plate be tested at a temperature of 51 degrees, another section be tested at 52, but they don't necessarily have to be in order. They don't have to be a gradient across the plate.

Each of the segments of the reaction vessel receiving element are completely segmented, separated, so that you could have a 50-degree next to a 53-degree, followed by a 52-degree. They don't have to have any kind of gradiant across the micro titer plate. So that's what we're going after here, and the way they accomplish this is with the segmented reaction vessel receiving element. And I think probably the best figure for this maybe is figure 2. And you can see what you're looking at there is actually the segment that reactions are for receiving elements. There's a number of segments, either 10 or 8, depending on how you read the specification is the segment.

So, in each of these, there might be say six or eight, or four, depending on how many you want segmented. And the plurality of segments will hold one micro titer plate. And then the other thing is these segments are so segmented that they literally are in separate pieces, including perhaps the cold plate or the heating plate. And the cold plate and the heating plate can be a combination, like a Peltier device. So it's all one segment, individual, discontinuous, so there's discontinuity between the segments.

And we even have in some of the dependent claims and in the

figures, these segments are so disconnected that they might have to be connected by hooks, which are the claims 39 and 40 that were allowed by the Examiner. So in order to keep these segments stable and together and to be able to support the one micro titer plate, they might link them together somehow. But, functionally, they are completely segmented, and I think that's the characteristic that maybe we might have taken for granted or assume that when you read "segment" in the claim and you think, okay, well something can be segmented and separated.

But if you look at the specification and you read the claims in light of the specification, you understand how segmented we mean. We mean that all the components of that segment are distinct from components of an adjacent segment. And you'll be able to see that if you look through the dependent claims, as I'll go through a little further. And I do have, if you like, I have some support in the specification where they talk about the segments are individual, separate, divided. So we always use language like that in the specification. We hope that you'd important that understanding into the reading of the claim.

JUDGE WARREN: So you essentially can divide the plate into two parts, or three or four parts or six parts, with respect to each?

MS. FISHER: The micro titer plate is all one plate.

JUDGE WARREN: No, that's what I mean. You can heat two parts of it or you can heat four parts of it?

MS. FISHER: Exactly.

JUDGE WARREN: And it's covered by your claim?

MS. FISHER: Exactly. And then the benefits of that is like

being a prior art or other ways that people do it, if you want to perform, you either need a lot of micro titer plates, a lot of separate modules like Gordon's doing. Or, in the other, you would literally have to pipe that sample out of the vessels or the wells into others, so you don't have any cross contamination of wells. You can just take that whole plate with whatever samples you have and make whatever tests you need to. So maybe want to test one sample, but you want to know what different reaction times and temperatures do on that sample. So you can segment it out and perform separate tests all with one sample plate.

So if you use a separate reaction, a separate reaction with separate devices, like for example in Gordon, you might not have the exact same sample. There might be some contamination. Maybe your heat temperature, your times aren't exactly replicated. This way it's all self-contained in one system. So it's a huge advantage for the industry.

JUDGE KRATZ: Now, just this micro titer plate, isn't the plate of Potter a micro titer plate - the plate 10 in figure 1?

MS. FISHER: No. 10 is part of the segment, so the plate.

JUDGE KRATZ: 10 - element 10 - where they put the samples.

MS. FISHER: Well, the samples will be sitting in what we call 10 is a segment element. My understanding is that 10 is part of the segmented reaction vessel receiving element. So if you look at --

JUDGE KRATZ: So if you look at column 7, lines 18 to 20 of Potter, what he says is the samples are arranged as an array, preferably in rows of 12. And this preferably has an array of 8 by 12 or 96 samples in a micro titration plate format. And I believe it refers to that element 10 as

micro titration plate. And you don't have a standard definition for that plate, do you, in your spec?

MS. FISHER: We don't have it in the spec. It's just the term of the art that it's something that they used throughout the industry, and that's why they wanted to standardize this list.

JUDGE KRATZ: Because he calls his a sample plate, but he says they are a micro titration type plate array.

MS. FISHER: Right.

JUDGE KRATZ: And that's the question is how would your micro titration plate read off of something like Potter has.

MS. FISHER: It would be -- now -- maybe I'll have to ask Mr. Makrogiannis for clarification.

MR. MAKROGIANNIS: Typically, when we're preparing the micro range, which is a flat substrate that has a certain number of test sites that is prepared by taking the wet substances that are in a micro titer plate and using those to spot onto a flat substrate. So there's an advantage for the volume that's usually a set of needles that are dipped into the micro titer tray to spot onto a similar footprint on the micro array substrate, which is a flat, continuous surface.

So what he's talking about in Potter is that taking advantage of the arrangement of the samples on a micro titer tray, he is transporting them onto a micro array that have the same arrangement. But the physical configuration and separation that exists in a micro titer tray does not exist on a micro array, because the whole advantage is that there is one uniform hydrodizing ruler that floats overall through a micro array.

JUDGE KRATZ: Not exactly, because I believe he has separate wells right in Potter.

MR. MAKROGIANNIS: Right, but I think what he's talking about is using the format of the 96 welled trays in order to prepare the substrate that is then heated during the micro array processing.

JUDGE KRATZ: But he does call that just a sample plate, and you're saying your micro titer plate is different than that sample plate.

MS. FISHER: Right.

MR. MAKROGIANNIS: But, just the same, Potter there's heating cooling that is made reference to in Potter is not referring to the micro titer tray. It's referring to the micro array substrate.

JUDGE KRATZ: Okay. But I think he is talking about heating those fluids in that sample tray.

MS. FISHER: Yeah, and he calls it a sample tray, but it's not. That's what I was hoping to explain is the micro titer plate is a glass prepared array of 96 wells with all your samples and everything in there that you can just transport and put onto the segmented reactions of the receiving element.

JUDGE KRATZ: And here's what Potter says. He has samples replaced in a plastic plate with sample wells constructed so that the bottom of the wells are then less than 0.45 millimeters. And those typically are less than that. And he says he uses a plastic. It sounds very much like a micro titer plate. I'm not sure how they differ.

MS. FISHER: He did not specify in the specification what exactly if the micro titer plate is: glass, ceramic, what it's formed of. Because it was assumed that that's the standard term in the industry, that people are

using the micro titer plates just like in Gordon understood that there's the plates that get used in the different systems.

So I think the one in Potter is fabricated specifically for that. And you noticed if you read more in the details they talk about how the plastic will bubble and hoping that the Potter plate will react forces against the bubbling of the plastic. So those kind of activities aren't going to happen in a typical micro titer plate, because it's fixed to the wells. The wells are fixed, the fix step. It's not a flexible device; it's a fixed device.

JUDGE KRATZ: And so Gordon, when you get to Gordon, which is the primary reference, and where they have the separate modules with a plate for each module, you are saying those are micro titers?

MS. FISHER: Those are micro titer plates. That is my understanding.

JUDGE KRATZ: Titer plates in Gordon, and you say they differ from the plate of Potter?

MS. FISHER: They differ because they're a fixed structure. Potter is a flexible structure that they expect to expand and contract. And I think it's specific to that device that they are using, because they do describe how the side walls can flex. It can bulge when it's heated, and then it presses against the spreader plates, so that the bolting of the plastic doesn't cause the sample inside that well to go to the edge of the well, so to speak.

So those kind of things aren't going to happen in the standard micro titer plate, because it's a fixed device.

JUDGE KRATZ: Yes.

MS. FISHER: Okay? And then in the rejection that the

Examiner put out, as you know, Gordon was the primary reference. His reason for combining Gordon, Yasuda, and Potter was he says it would have been obvious to modify Gordon such that it would provide individual and independent heating/cooling of separate segments of one standard micro plate, and that micro plate is interchangeable with micro titer plate is my understanding..

The Examiner also recognizes that Gordon uses separate plates for the separate modules. We in a sense have modules which are the segmented, reaction vessel receiving elements, which would receive one plate. Now, so that would be tantamount to putting a massive plate over every module of Gordon?

JUDGE KRATZ: No. Not exactly. What you're doing is you're taking one of Gordon's modules and you are using at least two heaters for that module as opposed to Gordon having one heater for the module. But really the issue is Gordon does have a module where he has a plate, one micro titration plate sitting on top of associated with the heater and a cooling element, just like you have. But I think his heating element isn't designed so he can get separate temperatures for different parts of that plate.

MS. FISHER: Absolutely not; and he says that they don't want to do that.

JUDGE KRATZ: Well, he didn't say they don't want to do that. He says that they keep it uniform for the plate. And at the end of his spec, I think he does say we can actually just use one module. He actually says, while the invention has been described with respect to a cycler with multiple modules, the fast response temperature control of the present invention can be

used even in a single module cycler.

And if you viewed yours as a single-module cycler, he's saying, I think without giving you the details to a single module, he just doesn't tell us how he would do that.

MS. FISHER: Okay, so even if you had a single module cycler in Gordon, you wouldn't be able to take that heating element and heat different parts of the micro titer plate separately like we can do.

JUDGE KRATZ: Unless you modified it.

MS. FISHER: That's the whole technology.

JUDGE KRATZ: And that's where the Examiner is saying you have to modify, I think, Gordon to use more than one plate for a particular sample tray like they do in Potter.

MS. FISHER: Right.

JUDGE KRATZ: And then you would have what you're claiming. And why wouldn't that be obvious to do? That's really the issue.

MS. FISHER: Right, right, because -- I'll move on to the other references -- Yasuda talks about a sample plate with the individual heating of the specific areas of a single substrate 13. They have a plurality of heating elements 21 with a photo assayed, so they're hybridization areas with sample immobilized on the hybridization area, and then it's heated with the infrared laser, whatever, to heat it and create the reaction.

It can only do one target area at a time; whereas, we can do multiple target areas at a time. Also, if you tried to superimpose -- that's not a good word -- Yasuda onto Gordon, you run into the difficulty of not being able to distinguish whether Yasuda would be analogous to a micro titer plate,

what would be analogous to a segment to the reaction vessel receiving element, because they specifically say the target area is formed on the substrate and then the assay or the solution is immobilized on the target. So there's no separation. There's no flexibility. There's no indication unless you imagine it looking at our specification how could you segment that and incorporate it into the device of Gordon.

And the Examiner even admits. He says, that's not my best reference, please move on with Potter. So he realizes that that's not a great rejection, but.

JUDGE KRATZ: Well, no. You definitely have to modify that reference to get whet you're claiming. The question is would it have been obvious to do so, and I guess that's where we get back to this. What is a micro titration plate and, if in fact, one skilled in the art recognized: says hey, in the combination of these references we can see direction to segment, an individual plate, and use the single module like Gordon says, you can use and just run different temperatures on different portions of that single plate, which after all you do have multiple test wells on each single plate. And Gordon acknowledges that too, that you have multiples of 96 on one plate. So you don't need to run 96 at the same temperature. Why not run 12 of 1 and 12 at a different, you know, as opposed to using multiple plates run 96 at each of those different temperatures.

MS. FISHER: Right, and I think that you're able to do that because you're looking at our drawings and seeing how they're segmented. And so you're saying, okay, we'll look at these other plates. Let's just slap these plates on top of Gordon. Why wouldn't that work? Well, because it

isn't really a micro titer plate. It's not a reaction vessel receiving element, and you can't dissect it to get to that unless you look at our specification and drawings and say, oh, yeah, well let's pick it apart. And sure, you could divide it, but no, you couldn't. I don't see how can make that leap.

JUDGE KRATZ: Well, the plate itself, the micro-titer plate is not segmented. It's the holder. It's a reaction vessel element, and a reaction vessel element is merely the surface where you have those separate heating elements.

MS. FISHER: Right, so if you have Gordon that says sure, we can use one heating, cooling element, to keep cool in one module, we can combine that one module. There is no description of how. Do we have a gradient across there? Can we separate parts of that module to keep each one separately? There's no getting that from our disclosure. And if you took Yasuda.

JUDGE KRATZ: Yeah, or Potter. You have to get it from Potter.

MS. FISHER: From Potter, okay, so can we move on to Potter?

JUDGE KRATZ: That's the issue; it's how equivalent are the titration plates of Potter to the micro titration plate of Gordon. That's really what I think it turns on.

MS. FISHER: Okay, and admittedly when experts which these guys are addressing these applications and these micro titer plates, to them they buy and sell those all day. So to them that's what that is. And you can easily distinguish that between the support with the substrate that Potter uses, the flexible walls, and it's not something that's fixed and can be repeatedly

used at different sites.

That's the interchangeability and the discontinuity of the segments is what you see here. Now, Potter has applied to the individual controlled heating of several samples. Yes, they do that. The difference here, and I'm going to have to dig into some of the dependent claim 6 to explain this a little further, but the difference is that Potter isn't truly segmenting. When you look into our specification and you read our claims and some of the dependent claims, you can see what we truly mean by segmenting. Actually, it's individual piece. It's thermally decoupled from anything adjacent, which is evident by the fact that you can set them at different temperatures.

So that while Potter does have the spreader plates in a setting mat tray vessel on the Spiro plates, and he says it's thermally decoupled. But if you read the specification, it really is not. He admits that he has lateral heat loss and vertical heat dissipation. The goal is to get the heat down to the cool plate, obviously, so that they can control the temperature in each of those Spiro plates.

JUDGE KRATZ: But all your claim requires is just that they're segmented such that different temperature levels may be set and maintained. So it could be one degree difference. It doesn't require much segmentation as long as you have a capability of keeping a one-degree temperature difference, let's say, between two different sections of that.

MS. FISHER: Right, but if you look at the claim as a whole, we also need the one micro titer plate. We need the reaction of the receiving element, which we use the word divided into several segments. Each segment has one heating device. The individual segments are thermally decoupled.

You're not getting those limitations from Potter. They're not technically, thermally decoupled, even though he throws that language in there, because you have heat dissipation that could go to heating elements of adjacent plates, because they have that web. I think it's 96. I'm not sure what the number of the web in there is.

JUDGE KRATZ: The web, 96?

MS. FISHER: 29 or 30.

JUDGE KRATZ: You have 30.

MS. FISHER: Okay. So the web is what's supporting the heating elements, and the web is what transfers the heat, that dissipates the heat to the cold bar. But they admit that it does have lateral dissipation, and they're hoping that "most" of the radial flow does not reach the adjacent samples, but flows into the cold block. So the heat flows between samples can be minimized. So they haven't completely solved the problem like we have by segmenting the reaction.

JUDGE KRATZ: Well, they say they minimize it. Right?

MS. FISHER: It's gone, or as it's gone it's thermally decoupled. It's divided. It's segmented. And I'm trying to encourage that reading in light of the specification.

JUDGE GAUDETTE: How do we know that you're thermal decoupling is different than the thermal decoupling in the reference? I mean, I know what you're saying the difference is, but in terms of the language.

MS. FISHER: Well, once again, I guess when you're writing the specification with the experts, thermal decoupling means a decouple is a physical separation. So the heat is physically prevented from transferring it to

another adjacent segment, thermally decoupled.

JUDGE WARREN: But you have to have a special titer tray to do that, wouldn't you? Titer tray? So in other words, to make your segments work, wouldn't you need a plate that does not transfer heat?

MS. FISHER: They don't transfer heat because they're not joined by a plate. They're each individual.

JUDGE WARREN: No. I meant the plate itself.

MS. FISHER: The tray? The tray that sits on top?

JUDGE WARREN: The tray on top.

MS. FISHER: That's just a non-conducting tray.

JUDGE WARREN: That's not a heat conducting tray?

MS. FISHER: No. Are they non-heat conducting?

MR. MAKROGIANNIS: Correct.

MS. FISHER: Yeah. And I guess that would be something that you would know in the art. So all things considered, I think it's definitely a looking backward based on our specification to try to modify Gordon with Matsuda. I guess is pretty much, I mean, that's a difficult leap in my mind. I understand the temptation to combine Potter, but I think Potter also has explicit disclosure that teaches away from absolute thermal decoupling, the segmentation that we're trying to claim.

Now, I want you to be happy, so I'm going to appreciate the fact that some of our dependent claims are very helpful in getting our point across. For example, in claim 19 we have a cooling device for cooling the reaction. That's the receiving element. And in claim 20 we say that cooling device is just per segment.

JUDGE KRATZ: These aren't separately argued, right? Only several are, is that correct?

MS. FISHER: I think I did separately argue that.

JUDGE KRATZ: On 21, right?

MS. FISHER: Yes. Oh, yes, 20 and 21. Okay, so as you get into the dependent claims, the doctrine of claim differentiation applies, but you can see how we really are assigning a heating/cooling element to a single segment. And when you read in the specification it even describes how our base support is 11, upon which is a heating/cooling element upon which is the, you know, receiving segments that are going to hold the portion of the tray. So if you look back to the specification, we're very clear about how that's divided. And then when we get into the dependent claims, we point out, yeah, we have a cooling, one heating, one cooling per segment.

Okay, and even in claim 21 wherein the segments of the reaction vessel receiving element are each comprised of those specific components. And I would also like to point to claim 23 and 25, which specify that the segments are separated by an air gap. Admittedly--

JUDGE KRATZ: Those aren't separately argued again?

MS. FISHER: Oh, okay. When you review this after the fact, feel free to make note. I didn't argue 25 or 23?

JUDGE KRATZ: I don't think so. That's my recollection. I don't want read it right now, but you argued 21 and 22 separately.

MS. FISHER: Okay, and then what about 45? Did we talk about the individual segments?

JUDGE KRATZ: And I believe you got down in the 40s I think

you read a couple.

MS. FISHER: Okay. So I guess the point that I would really, really like to leave you with is how we are truly segmenting. We have this disassociation between adjacent segments that even if you modify, Gordon, you're not going to be able to achieve that. Because, I mean, the one heating plate heats that whole module to different temperatures for varying times. Sure. But not different segments of a micro titer plate that would be seated on there. I believe.

Do you have anything to add?

Do you have questions for either of us?

JUDGE WARREN: Any questions?

Thank you very much.

JUDGE KRATZ: I'm not going to ask you about the reactions that go on in these things.

MS. FISHER: That's why he's here. I could explain it to you extremely simply.

JUDGE KRATZ: No. Well, because that's apparatus and we really don't need to know. It's just that it could be any kind of reaction in terms of the issues before us.

JUDGE WARREN: Ms. Fisher, if you would, please, for Mr. Carr.

MS. FISHER: Yeah, chemical or biological reactions. They are typically used for the PTR processing. Okay?

JUDGE WARREN: That's fine. Thank you.

Please give Mr. Carr a business card, if you would.

[The hearing was concluded at 11:48 a.m.]